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10/035,868	12/31/2001	Jason Michael Neidrich	TI-33419	4881

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EXAMINER	
LAM, HUNG H	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 01/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/035,868	NEIDRICH, JASON MICHAEL	
	Examiner	Art Unit	
	Hung H. Lam	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09/02/05*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *8,18-24,28-30,37 and 38* is/are withdrawn from consideration.

5)☒ Claim(s) *25-27 and 31-36* is/are allowed.

6)☒ Claim(s) *1-7 and 9-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Claims 8, 18-24, 28-30, 34 and 37-38 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 09/02/05.

2. The Applicant is reminded that upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Specification

3. The specification is objected to because of the following informalities: The sentence on page 22, line 19 -"Although only"- is incomplete. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-7, 9-13, 14, 16 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Chretien (US-6,864,473).

With regarding **claim 1**, Chretien discloses a device for masking one or more selected areas of a field of view while capturing an image, comprising:

an image aperture formed in the device (Figs. 3A-3B wherein the bright-light source 40 passes through lens 12; Col. 8, Ln. 5-8);

a spatial light modulator (Figs. 3A-3B: shading matrix 30 and Fig. 11-12: DMD 210) comprising an array of movable reflective elements (Col. 8, Ln. 8-12; Col. 15, Ln. 55-65; Col. 16, Ln. 58-59; Chretien teaches that the shading matrix 30 may be replaced by a digital micro mirror {DMD 210} which commonly known in the art as spatial light modulator), the SLM being positioned at a first angle with respect to a central axis of image light rays entering the device through the image aperture (see Figs. 12, 14-17; it is inherent that the incident light x enters the system through an aperture), and the SLM being positioned such that the image light rays will hit at least some of the reflective elements on the SLM (Figs. 14-17; Col. 16, Ln. 52-64 wherein the light beam x hits mirrors 212a which represents a portion of DMD 210); and

an image capturing device for use in recording an image (Col. 6, Ln. 38-45; Col. 8, Ln. 17-34; Col. 16, Ln. 28-35; Figs. 3A-4B and Fig. 12; Chretien teaches that the system 100 of Fig. 1 may be added to the font of a camera; therefore, the receptor 50 of Figs. 14-17 is

interpreted as an image pickup device), the image capturing device being located in a position such that, when at least some of the SLM reflective elements are in a first position, at least some of the image light rays reflected from the SLM reflective elements positioned in the first position will hit at least part of the image capturing device (Col. 16, Ln. 13-42; Col. 17, Ln. 10- Col. 18, Ln. 3).

With regarding **claim 2**, Chretien discloses the device of claim 1, wherein the SLM comprises a digital micro-mirror device (Figs. 11,12, 14-17; DMD 210; Col. 15, Ln. 55- Col. 16, Ln. 51).

With regarding **claim 3**, Chretien discloses the device of claim 1, wherein the SLM comprises an anti-reflective membrane device (Col. 16, Ln. 18-27 wherein the DMD 210 may be adjusted so that light is no longer reflected to receptor 50).

With regarding **claim 4**, Chretien discloses the device of claim 1, wherein the SLM comprises a deformable film modulator device (Col. 16, Ln. 18-27 wherein SLM is commonly known in the art as deformable mirror device or DMD).

With regarding **claim 5**, Chretien discloses the device of claim 1, wherein the image capturing device comprises a digital light sensor (Col. 8, Ln. 20-44).

With regarding **claim 6**, Chretien discloses the device of claim 1, wherein the image capturing device comprises a charge-coupled device (Col. 8, Ln. 44-45).

With regarding **claim 7**, Chretien discloses the device of claim 1, wherein the image capturing device comprises photographic film (Col. 8, Ln. 45-56).

With regarding **claim 9**, Chretien discloses the device of claim 1, further comprising: a lens located in the image aperture (Fig. 3A-4A: Chretien further teaches lens 12 and 62 which are located at the camera's aperture).

With regarding **claim 10**, Chretien discloses the device of claim 1, further comprising: a lens located within an image reflection path between the SLM and the image capturing device (see lens 232, DMD 210 and receptor 50 of Fig. 14; Fig. 17 further shows lenses 324 and 325 which are located between an optical path of a DMD 310 and the image plane 330/ CCD sensor 334).

With regarding **claim 11**, Chretien discloses the device of claim 1, wherein the device is a camera (Col. 6, Ln. 38-45; Col. 8, Ln. 20-45).

With regarding **claim 12**, Chretien discloses the device of claim 1, wherein the device is part of a video camera (Col. 6, Ln. 38-45; Col. 8, Ln. 20-45).

With regarding **claim 13**, Chretien discloses the device of claim 1, wherein the device is adapted to be optically coupled to a telescope (Col. 8, Ln. 15-25).

With regarding **claim 14**, Chretien discloses a device for masking one or more selected areas of a field of view while capturing an image, comprising:

an image aperture formed in the device (Figs. 3A-3B wherein the bright-light source 40 passes through lens 12; Col. 8, Ln. 5-8);

a digital micro-mirror device (Figs. 3A-3B: shading matrix 30 and Fig. 11-12: DMD 210) comprising an array of movable mirror elements (Col. 8, Ln. 8-12; Col. 15, Ln. 55-65; Col. 16, Ln. 58-59; Chretien teaches that the shading matrix 30 may be replaced by a digital micro mirror DMD 210 which commonly known in the art as spatial light modulator), the DMD being positioned at a first angle with respect to a central axis of image light rays entering the device through the image aperture (see Figs. 12, 14-17; it is inherent that the incident light x enters the system through a camera's aperture), and the DMD being positioned such that the image light rays will hit at least some of the mirror elements on the DMD (Figs. 14-17; Col. 16, Ln. 52-64 wherein the light beam x hits mirrors 212a which represents a portion of DMD 210); and

a charge-coupled device (CCD) comprising an array of photon sensing elements (Col. 6, Ln. 38-45; Col. 8, Ln. 17-34; Col. 16, Ln. 28-35; Figs. 3A-4B and Fig. 12; Chretien teaches that the system 100 of Fig. 1 may be added to the font of a camera; therefore, the receptor 50 of Figs. 14-17 is interpreted as an image pickup device; Chretien further teaches that a camera body 38 comprising a CCD), the CCD being located in a position so that, when at least some of the DMD mirror elements are in a first position, at least some of the image light rays reflected from the DMD mirror elements positioned in the first position will eventually hit at least some of the CCD elements (Col. 16, Ln. 13-42; Col. 17, Ln. 10-Col. 18, Ln. 3).

With regarding **claim 16**, Chretien discloses a device of claim 14, further comprising: a controller electrically coupled to the DMD (see Figs: controller 20 is coupled to the DMD 210; Figs. 14-16: DMD driver 222 is coupled to the DMD 210), the controller being adapted to

selectively send signals to the DMD for causing one or more of the movable mirror elements to be actuated (Col. 16, Ln. 37-42; Col. 17, Ln. 20-67).

With regarding **claim 17**, Chretien discloses a device of claim 14, further comprising: an electrical circuitry electrically coupled to the DMD (see Figs: controller 20 is coupled to the DMD 210; Figs. 14-16: DMD driver 222 is coupled to the DMD 210) and the CCD (Col. 8, Ln. 30-45; Col. 15, Ln. 53-58; Fig. 4B: Chretien further teaches the controller 20 is coupled to receptive surface 66 {CCD} and shading matrix 30 which may be replaced by DMD 210).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Chretien in view of Hewlett (US-6,220,730).

With regarding **claim 15**, Chretien teaches a diaphragm, a video camera and shading matrix, which can be replaced by a DMD (Figs. 1 and 4B; Col. 6, Ln. 38-45; Col. 10, Ln. 35-44; Col. 15, Ln. 52-65). However, Chretien fails to disclose further a shutter adapted to block the image light rays from striking the DMD when the shutter is closed and to allow at least some of the image light rays to strike the DMD when the shutter is open.

In the same field of endeavor, Hewlett teaches a three positions rotatable shutter which is placed between a light source and a digital mirror device (DMD) (Abstract; Col. 2, Ln. 9-12). Hewlett further teaches that the first position changes any unwanted dim reflection to a circular shape, the second position allows substantially all the light to pass and the third position blocks substantially all light from passing (Col. 2, Ln. 14-19; Col. 4, Ln. 25-55). In light of the teaching from Hewlett, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Chretien by having a rotatable shutter place between a light source and a digital mirror device as claimed by Hewlett in order to pass partially/ substantially light to the DMD or completely block all light from striking the DMD. The modifications thus provide a means for controlling penumbra illumination surrounding the DMDs and other pixel-based rectangular imaging device without creating undesirable rectangular penumbra (Chretien: Col. 2, Ln. 1-5; Col. 2, Ln. 35-38).

Allowable Subject Matter

8. It is noticed that claims 34 and 36 are readable upon the elected species and thus have been rejoined. Claims 25-27 and 31-36 are allowed.

9. The following is an examiner's statement of reasons for allowance:

The prior art of record fails to teach or fairly suggest:

Regarding independent **claim 25**, " a method of astrophotography, comprising the steps of:

during a first period of time, reflecting a first part of an image off of a first spatial light modulator (SLM) at a first angle so that at least some of the first part of the image will eventually strike an image capturing device;

also during the first period of time, reflecting a second part of the image off of the first SLM at a second angle that directs the second part of the image to a first location where the second part of the image will not go to the image capturing device; and

during a second period of time, reflecting at least a portion of the second part of the image off of the first SLM at the first angle so that at least some of the second part of the image will eventually strike the image capturing device."

Regarding independent **claim 31**, "a method of exposing different parts of a field of view for an image for various lengths of time, comprising the steps of:

during a first period of time, reflecting a first part of an image off of a first spatial light modulator (SLM) at a first angle so that at least some of the first part of the image will eventually strike an image capturing device;

also during the first period of time, reflecting a first remainder of the image off of the first SLM at a second angle that directs the first remainder of the image to a first location where the first remainder of the image will not go to the image capturing device, wherein the first remainder of the image is the image minus the first part of the image;

during a second period of time, reflecting a second part of the image off of the first SLM at the first angle so that at least some of the second part of the image will eventually strike the image capturing device;

also during the second period of time, reflecting a second remainder of the image off of the first SLM at the second angle that directs the second remainder of the image to the first location where the second remainder of the image will not go to the image capturing device, wherein the second remainder of the image is the image minus the second part of the image;

during a third period of time, reflecting a third part of the image off of the first SLM at the first angle so that at least some of the third part of the image will eventually strike the image capturing device; and

also during the third period of time, reflecting a third remainder, if any, of the image off of the first SLM at the second angle that directs the third remainder of the image to the first location where the third remainder of the image will not go to the image capturing device, wherein the third remainder of the image is the image minus the third part of the image."

Regarding **claims 26-27 and 32-36**, the claims are allowed as being dependent of claim 25 and 31, respectively.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Moon teaches a dynamic optical filter wherein a plurality of selected micro-mirrors are flipped or tilted for deflect a portion of the incident radiation away from the return optical path.

b) Landecker (US-5,654,549) discloses a stelite focal plane array imager comprising a pointable mirror system.

c) Gale (US-5,285,407) discloses a spatial light modulator that described in terms of a deformable mirror device or DMD.

d) Smith (US-5,797,050) discloses a selective glare reduction ocular for scenery with very bright object.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung H. Lam whose telephone number is 571-272-7367. The examiner can normally be reached on Monday - Friday 8AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary, David Ometz can be reached on 571-272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HL
01/05/2005

DAVID OMETZ
SUPERVISORY PATENT EXAMINER